The CoastWatch Utilities

Peter Hollemans, Terrenus Earth Sciences for NOAA

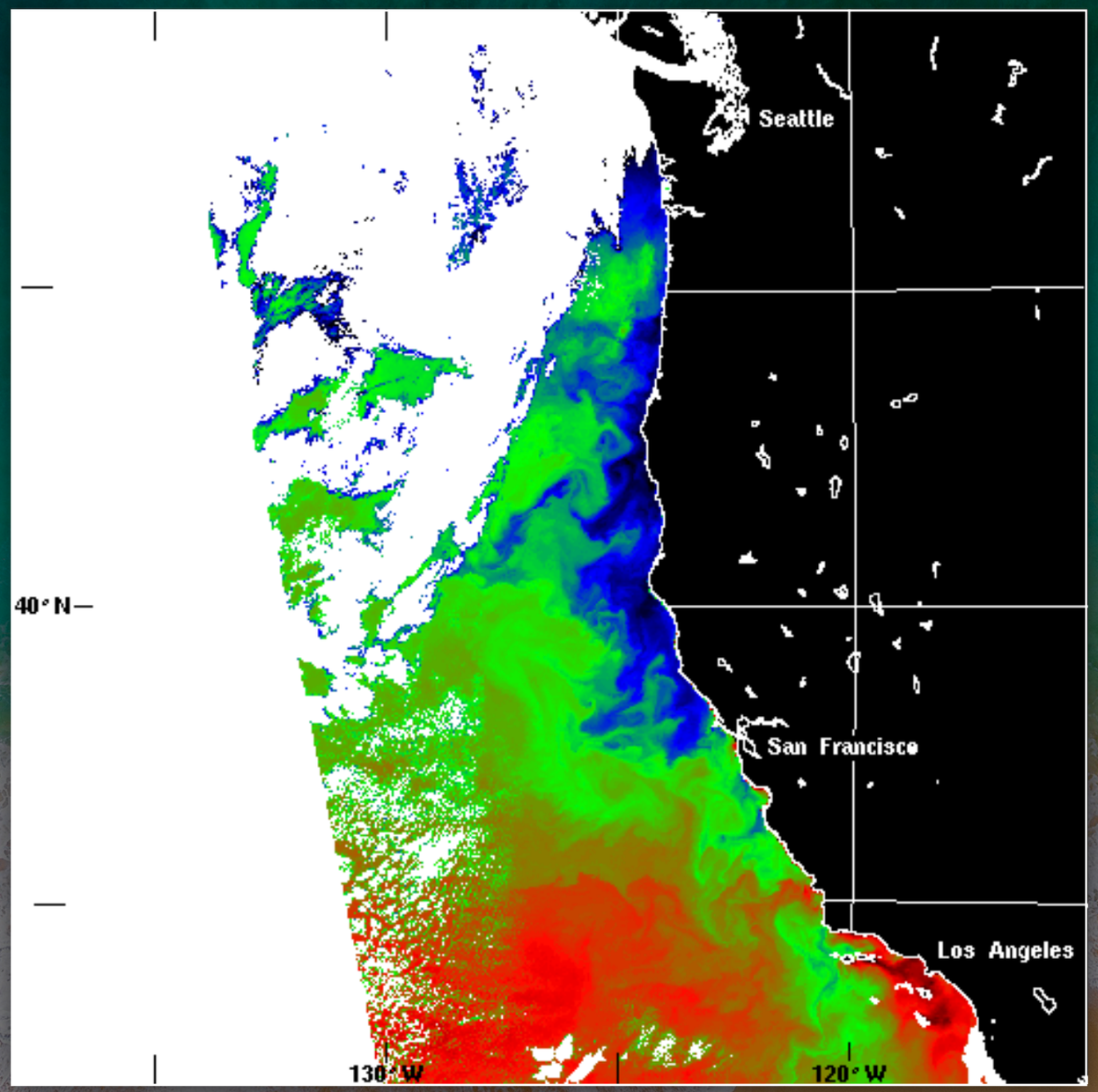
[Coast|Ocean|Polar] Watch Annual Meeting, Santa Cruz, Jul/Aug 2017

Outline

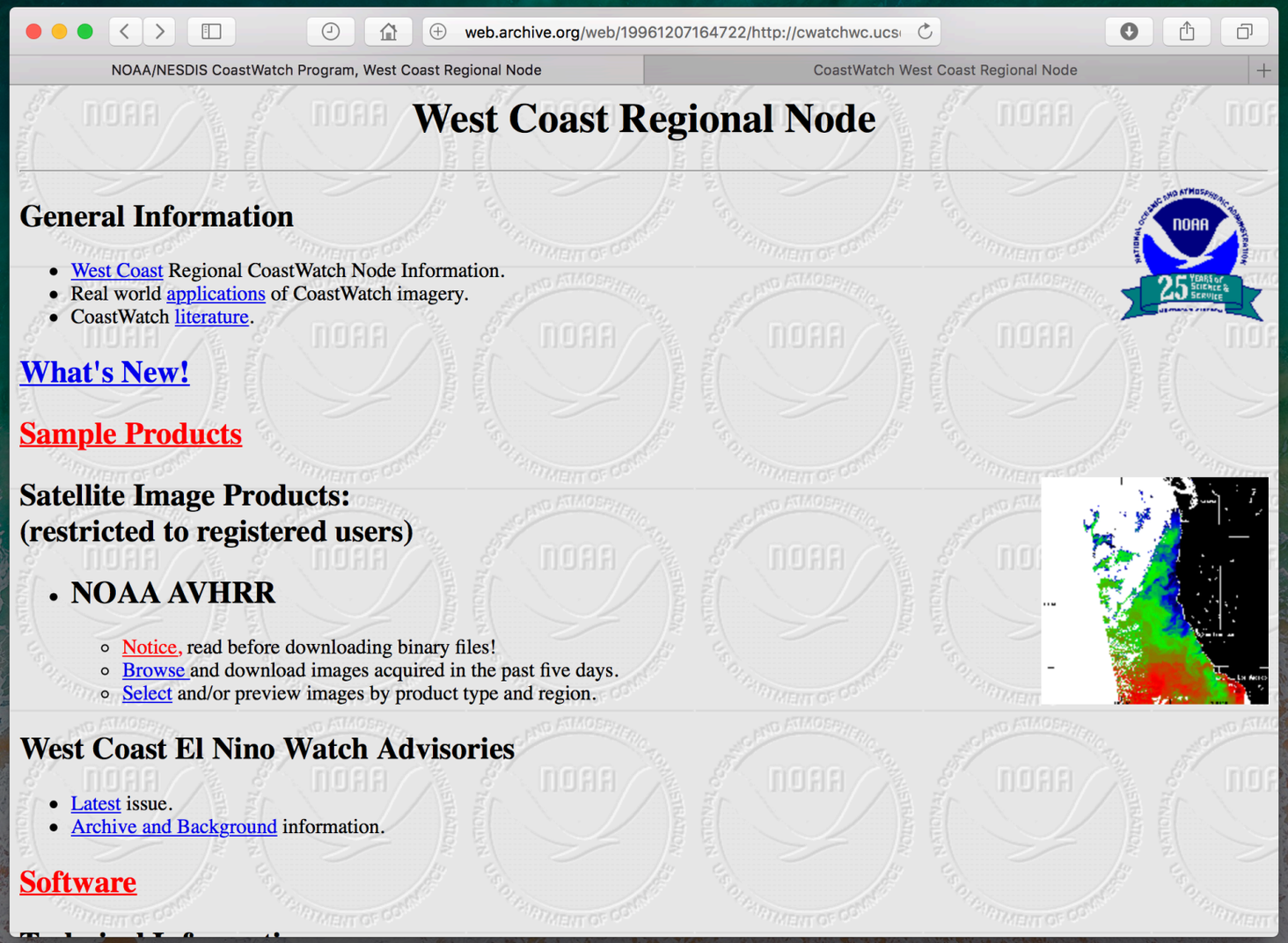
- Historical Perspective
- Development & Functionality
- Download & Usage
- Latest & Future Updates

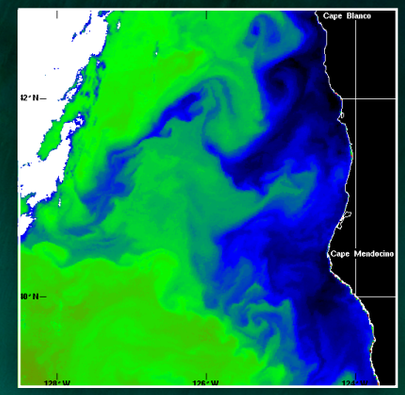
Historical Perspective

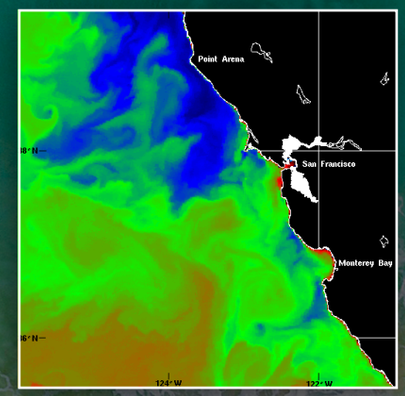
AVHRR SST

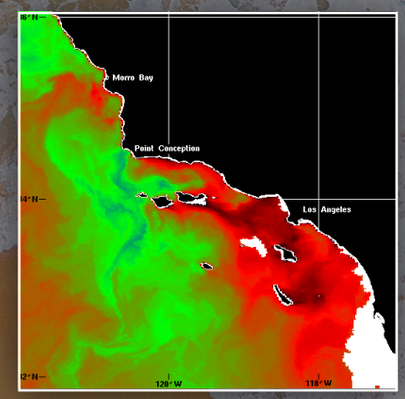


Distribution









Registration

APPLICATION FOR ACCESS
TO COASTWATCH PRODUCTS FOR NON-COMMERCIAL USE

Application #_____

The NOAA CoastWatch Program maintains a national capability to provide a rapid supply of up-to-date, coordinated, near-real time data products to support Federal and state decision makers and researchers responsible for managing the Nation's living marine resources and ecosystems. The Program provides time-critical "decision support" in response to rapidly emerging coastal environmental situations. The NOAA CoastWatch West Coast Node houses the West Coast Regional Site of the CoastWatch Program and serves as the delivery point for all products from the CoastWatch Program.

The NOAA CoastWatch West Coast Node provides all CoastWatch products via access to the NOAA Regional Site located at NOAA/NMFS Southwest Fisheries Science
NOAA CoastWatch West Coast Node makes
schedule and contents of the products
of the Applicant, although the schedu
products may be changed without consu
NOAA announces these changes at least
whenever possible.

This arrangement becomes effective up
signature, and shall remain in effect
NOAA or the Applicant with 30 days' w
Applicant may terminate this arrangem
upon providing 30 days' written notic

NOAA may terminate this arrangement after 30 days' written notice to the Applicant, if NOAA determines that:

(1) such termination is in NOAA's best interests, or

(2) technological difficulties result from the access provided for in this agreement.

NOAA may terminate this arrangement immediately if NOAA determines that:

(1) the Applicant has violated any provision of this arrangement, or

(2) the Applicant has failed to ensure that a recipient of the products furnished by the Applicant has complied with such provisions.

This arrangement shall be reviewed annually and may be amended as NOAA deems necessary. This arrangement supersedes all previous arrangements for the provision of CoastWatch data and products.

APPLICATION PROVISIONS

Through signature below, the Applicant agrees:

1. that NOAA is under no legal or financial obligations to provide any product to the Applicant;

2. to hold and save the U.S. Government, its officers, agents, and employees harmless from liability of any nature or kind, including costs and expenses, for, or on account of, any or all suits or damages of any character whatsoever resulting from injuries or damages sustained by any person or persons or property by virtue of negligence on the part of the Applicant, its officers, agent, and employees in the performance of this arrangement;

3. that products provided through this application are for:

   a) the exclusive use of the Applicant in cooperative research with NOAA, or

to use the data and information, and any derived products, only for research, education, and other non-commercial purposes.

person or organization except for the Applicant's employees and affiliates, for purposes directly related to the Applicant's activities as described in sec. 3.b.;

5. to ensure, to the maximum extent practicable, that individuals and organizations which have access to CoastWatch data, information, and derived products are aware of and observe the limitations on use and redistribution contained in this application;

6. to keep a record of all recipients of CoastWatch data and information;

7. to provide CoastWatch data and information at no more than the cost of reproduction and transmission;

8. to be solely responsible for the procurement, installation, service, maintenance, and removal, at no cost to NOAA, of all telecommunication lines and equipment required by the Applicant to interface with the CoastWatch Regional Site. The Applicant shall be solely responsible for routine maintenance of equipment on loan from NOAA;

9. to give full credit and identification of any products

that are furnished by the NOAA CoastWatch West Coast Node and to avoid implication that any value-added products derived by it are attributable to NOAA or any element of NOAA;

10. to provide NOAA CoastWatch West Coast Node with an annual written report describing projects which used products delivered over the network and describing how these products were used. The Applicant will provide the annual written report in May of each year subsequent to the signature of this application. Samples of the products will be furnished as appropriate or as requested by the NOAA CoastWatch West Coast Node;

11. that the Applicant has no permanent or exclusive right to receive CoastWatch data and information, and that CoastWatch data and information may be modified or suspended at the discretion of NOAA, without recourse.

PRINT) _____

DDRESS _____

_____

_____

_____

HONE # ( ) _____

EMAIL ADDRESS _____

RESEARCH / DATA APPLICATION _____

_____

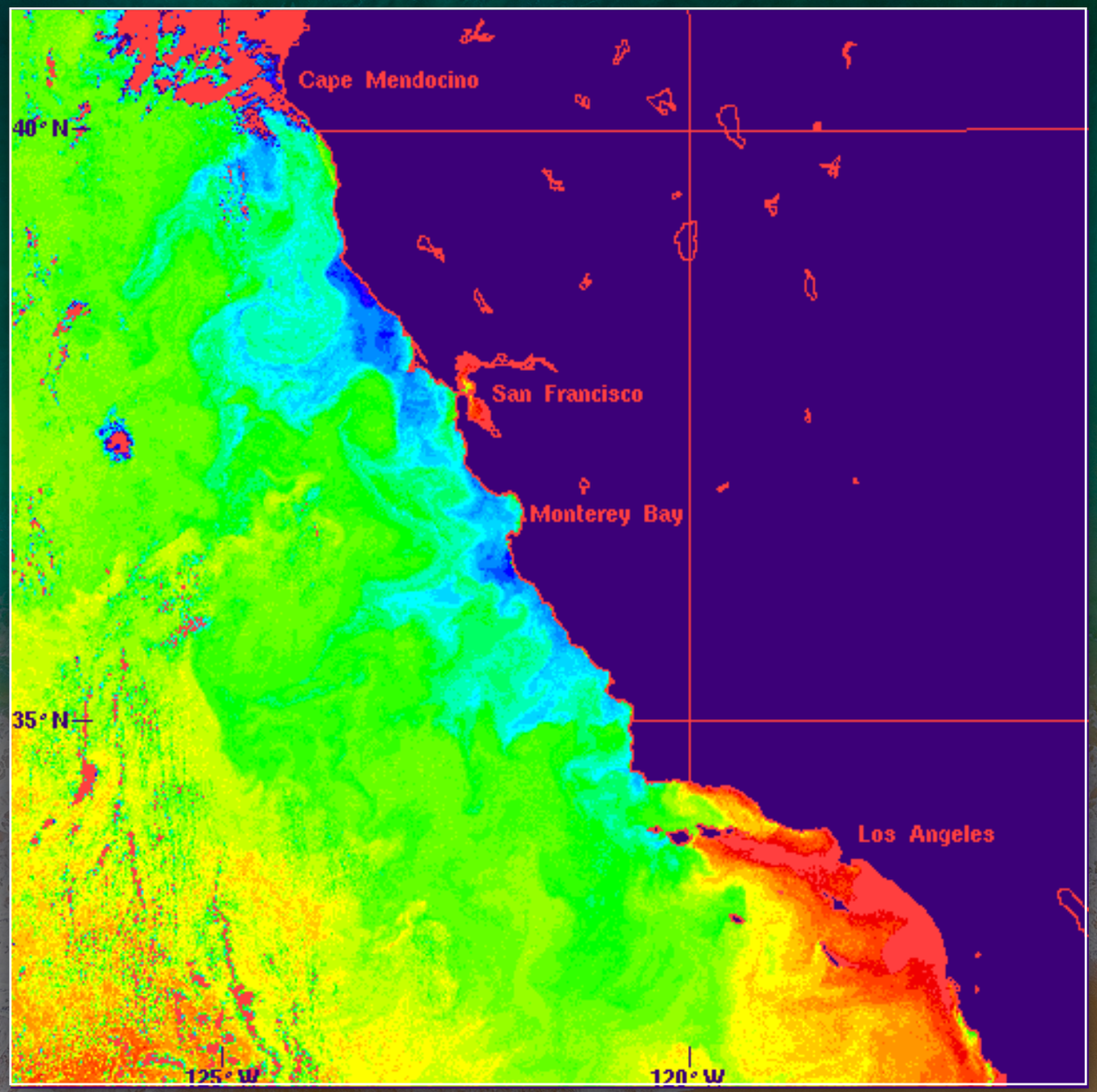
_____

_____

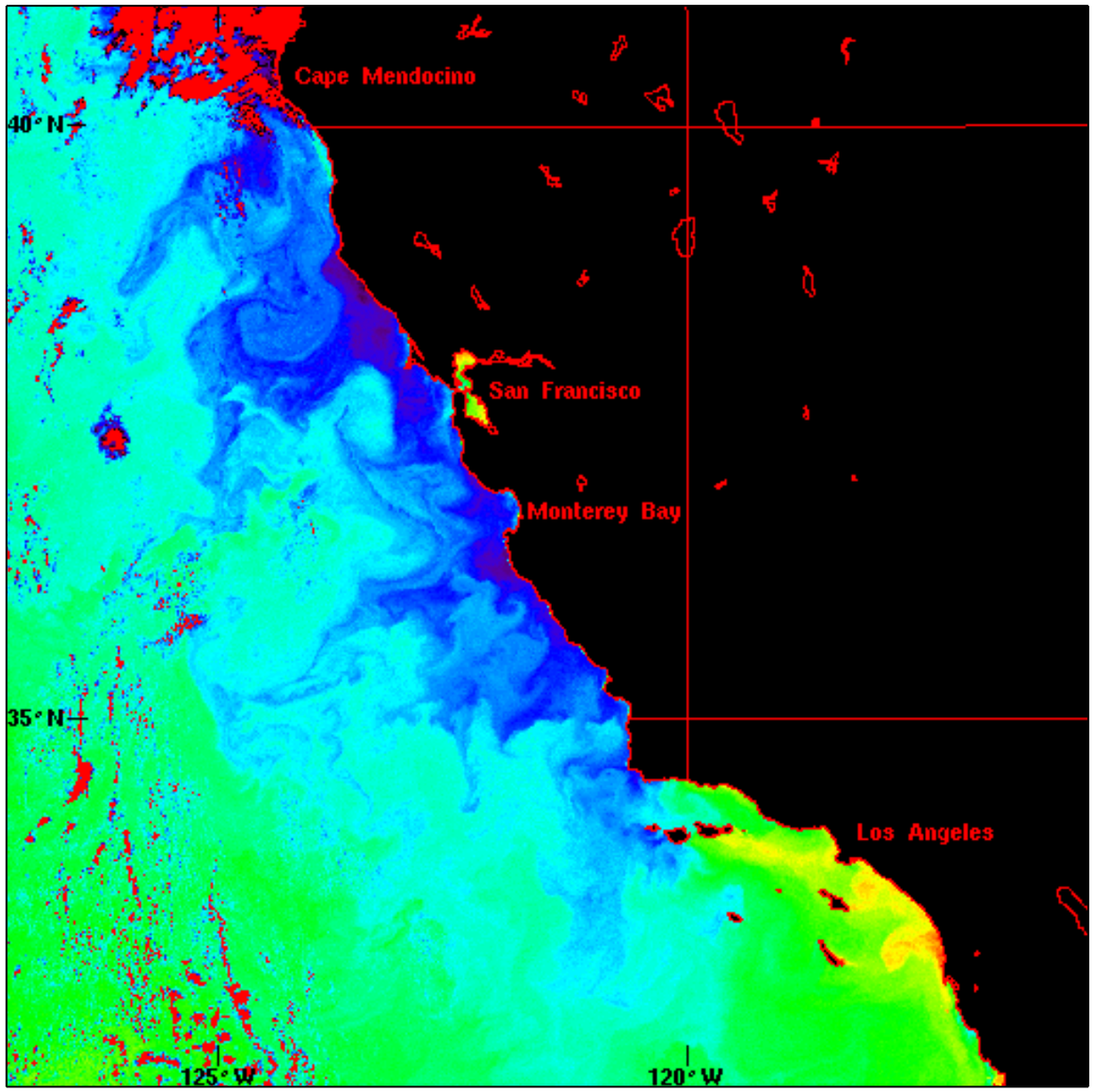
APPLICANT'S SIGNATURE _____

DATE _____

DECCON (1993)


Cape Mendocino
40° N
San Francisco
Monterey Bay
35° N
Los Angeles
125° W
120° W

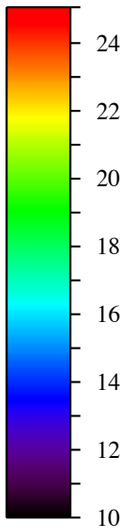
CWIPS (1994)



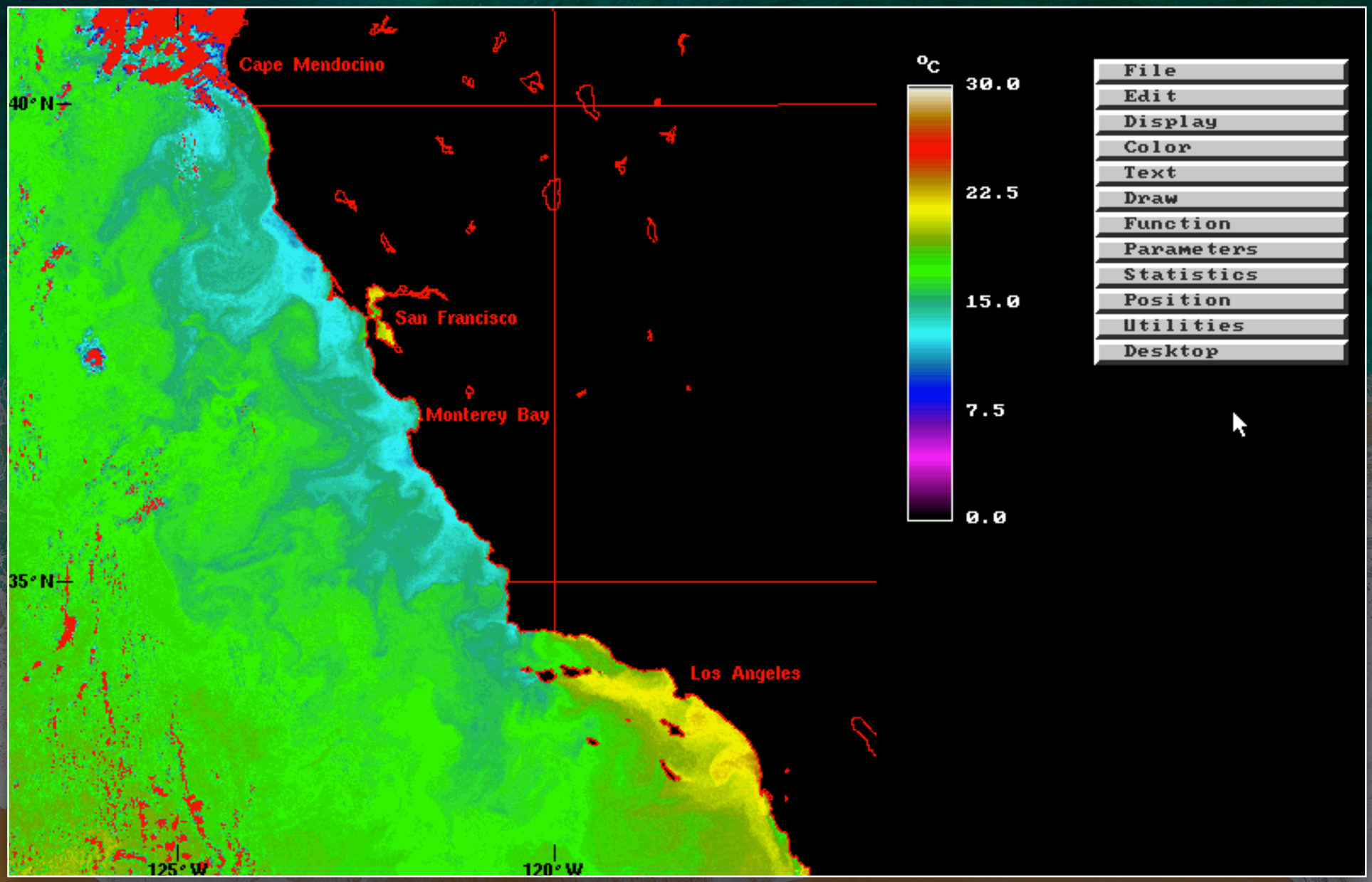
CoastWatch

AVHRR Temperature
Filename: W9718221.SD7
IMGMAP Image
NOAA 14 Orbit: 0
7/01/97 JD 182 21:58 GMT
Pixel Size: 2.38 km
Lat Range: 31.73N to 40.97N
Lon Range:127.23W to 115.74W
Horiz. Offset: -5659 0
Vert. Offset: 8554 0
SST - Split Window

Surface Temperature (Degrees Centigrade)



CCoast (1994)


Cape Mendocino
40° N
San Francisco
Monterey Bay
35° N
Los Angeles
125° W
120° W
°C
30.0
22.5
15.0
7.5
0.0
File
Edit
Display
Color
Text
Draw
Function
Parameters
Statistics
Position
Utilities
Desktop

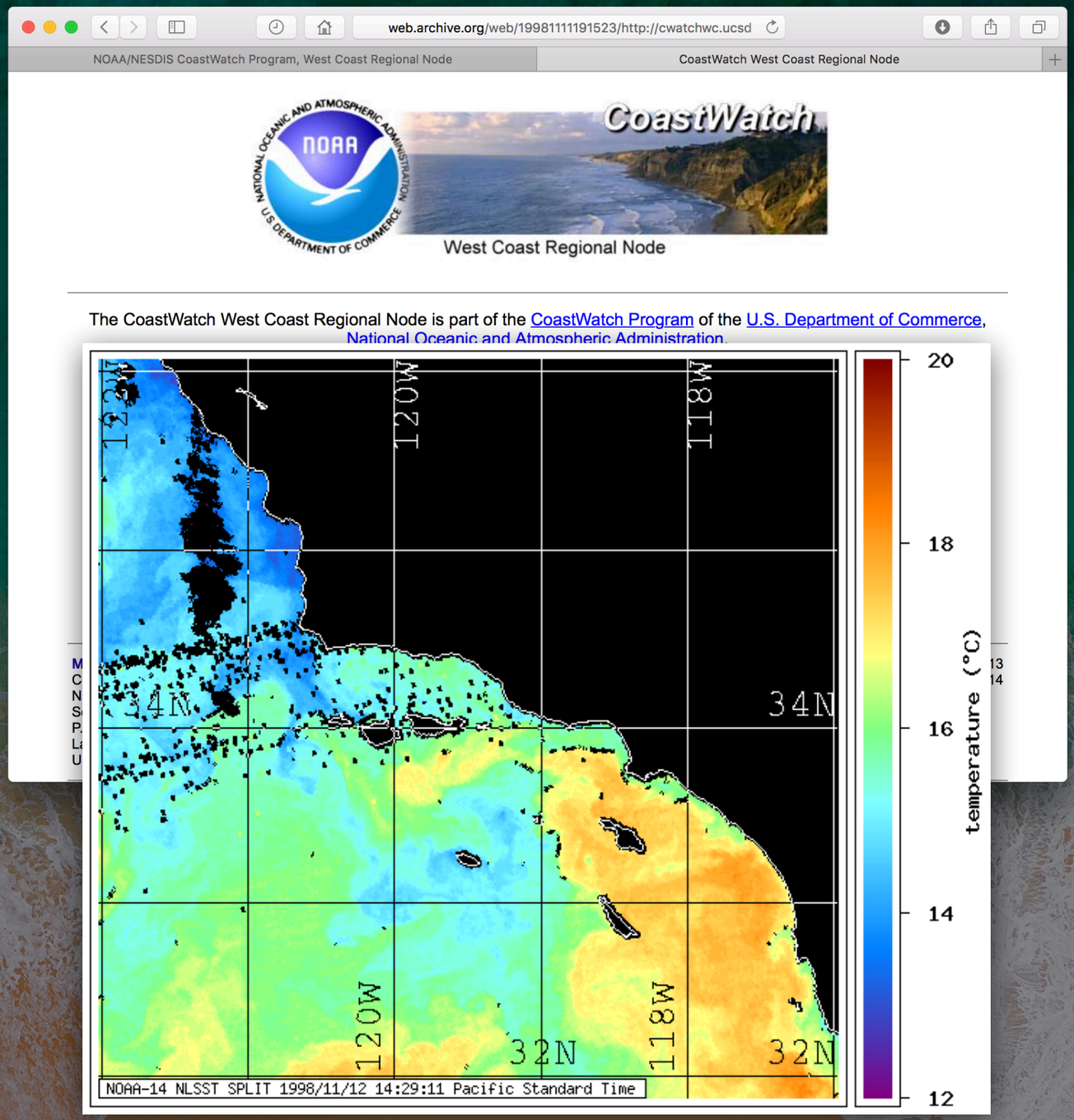
Trends

- Number of products available
- Distribution software
- Permitted data usage
- Level of user anonymity
- Analysis software

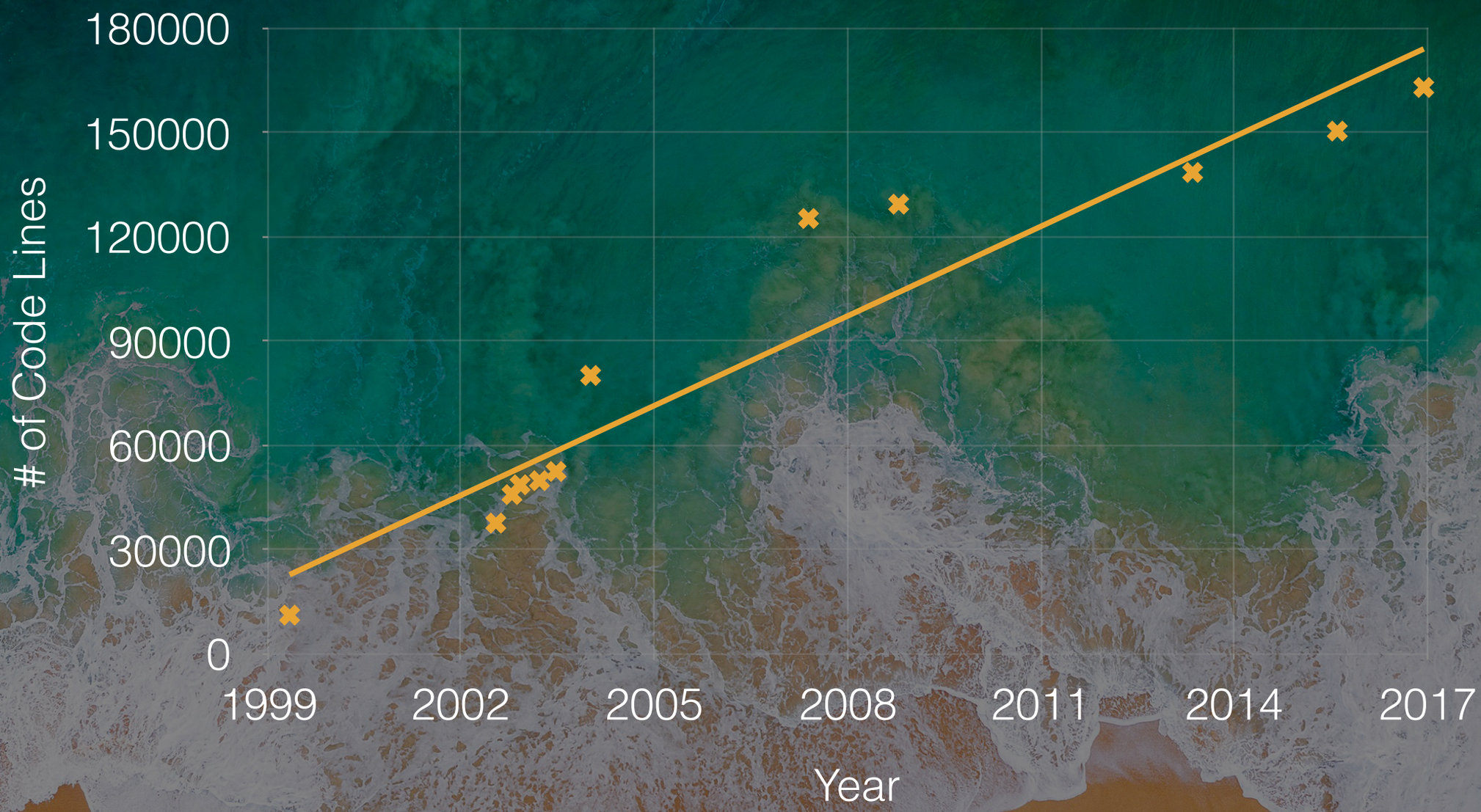
Development & Functionality

Initial Version

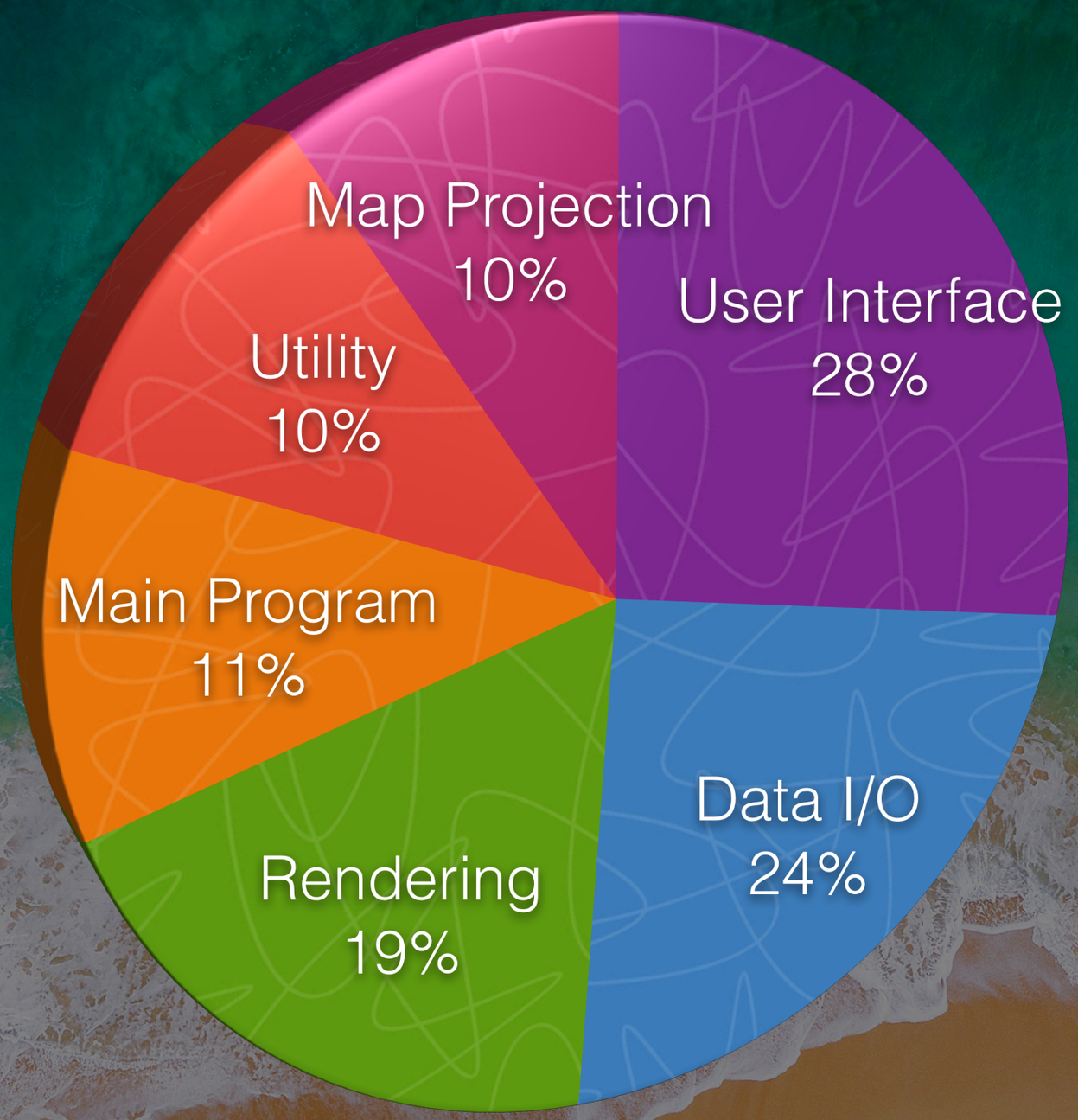
- West Coast node website scripts and product creation
- Product file read/write, render, conversion



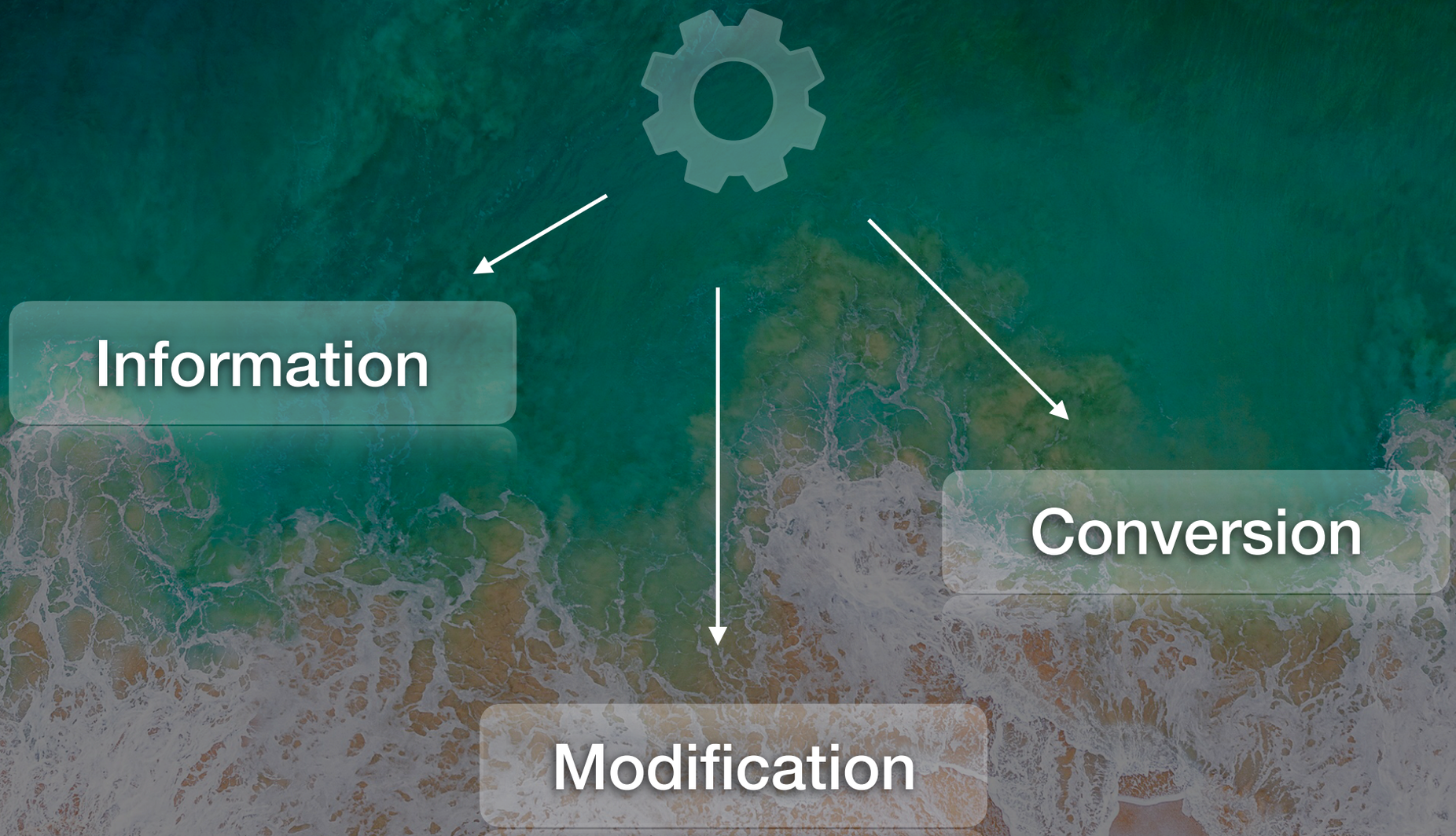
Source Code Size



Source Components

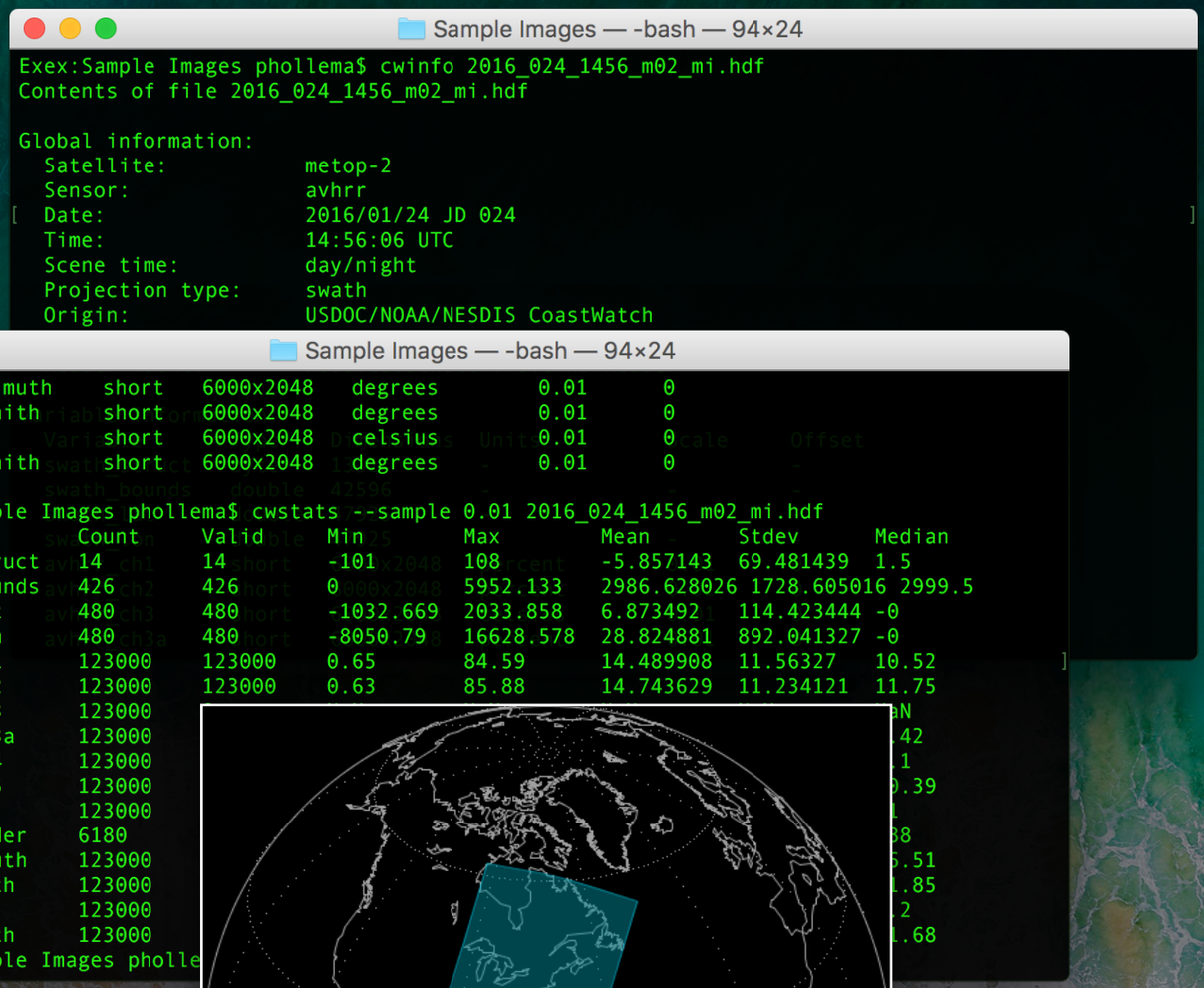


Operations



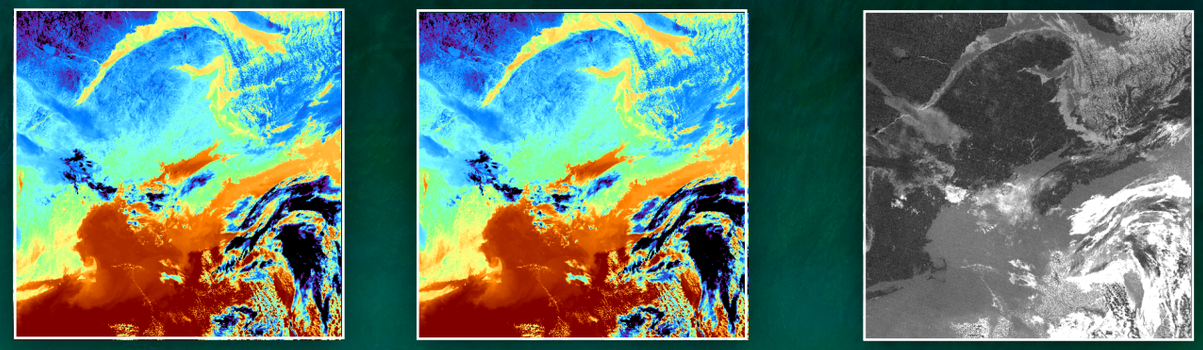
Information

- File metadata summary
- Dataset statistics and sampling
- Geographic coverage maps

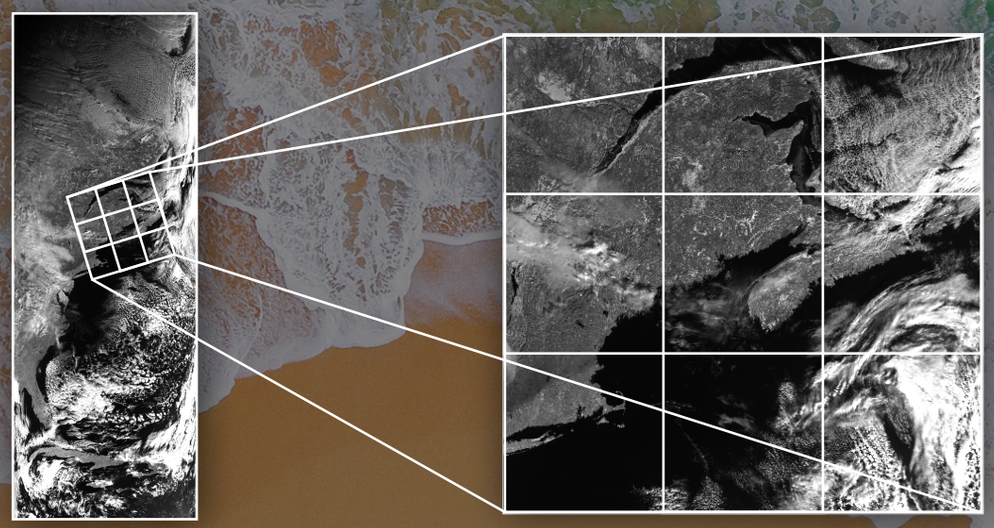


Modification

- Generic math expressions
- Time series composition
- Angle computation
- Registration to map projections

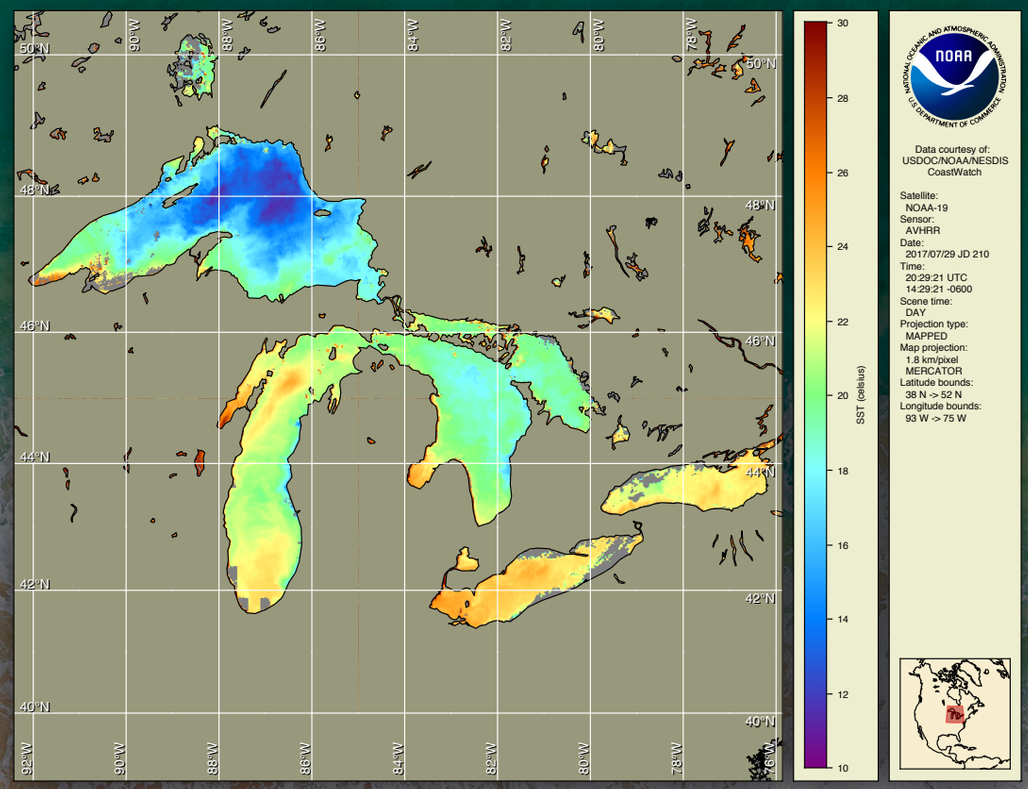


channel 4 - channel 5 = diff 45

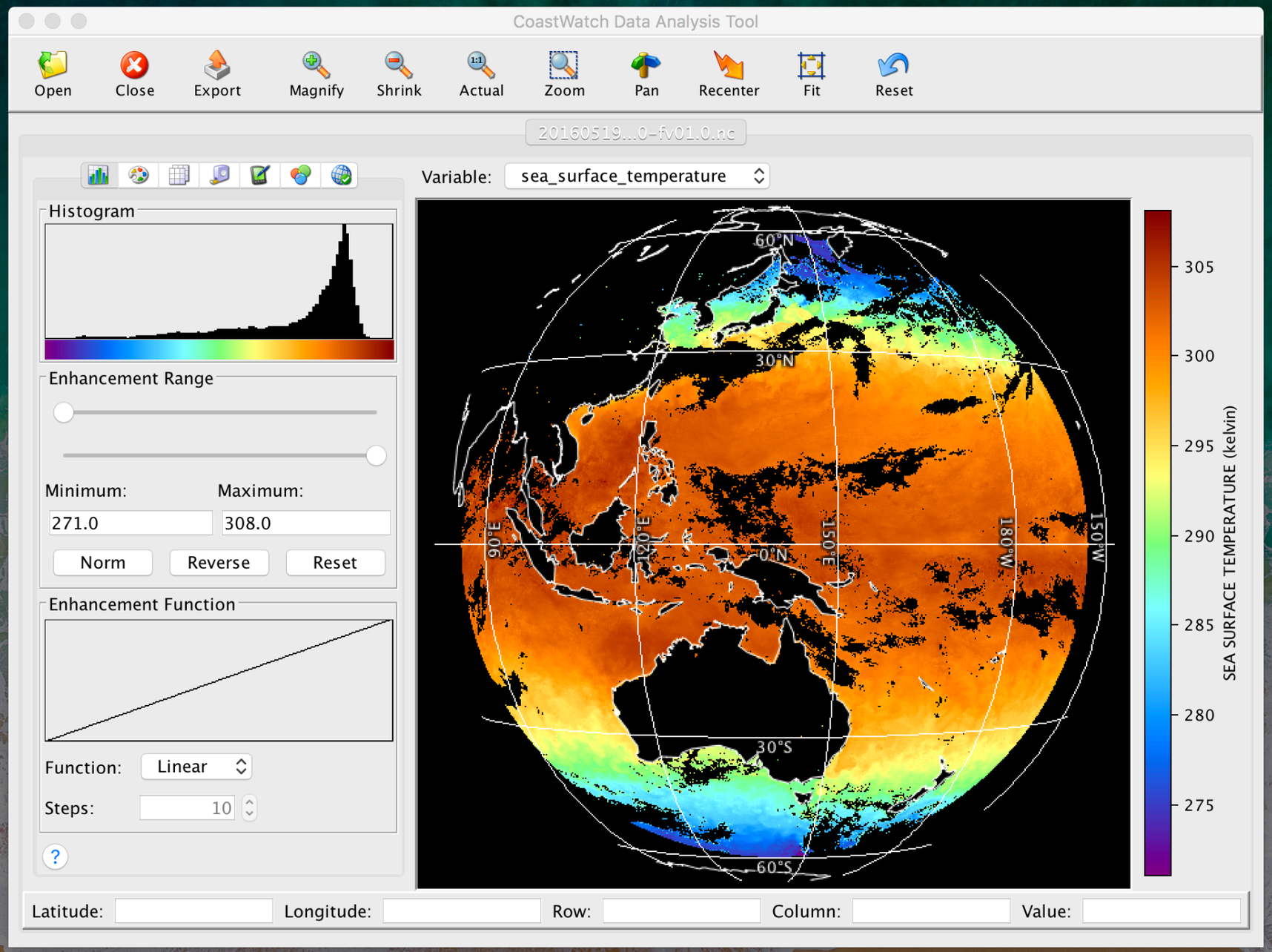


Conversion

- Import to HDF
- Export to ArcGIS, binary, NetCDF, text
- Render to PNG, JPEG, GIF, GeoTIFF, PDF



CoastWatch Data Analysis Tool



Download & Usage

Packages

- Download at coastwatch.noaa.gov
- Versions:
  - Linux
  - Windows
  - Mac

  64-bit
- Version 3.3.1 (stable), beta versions

Guides

- YouTube videos
- User's guide
- Unix manual pages
- Help menus

Formats

- HDF & NetCDF
- Level 2: AVHRR, MODIS, VIIRS, Himawari
- Level 3: most map projections
- NOAA 1b HRPT, LAC, GAC
- GRIB
- OPeNDAP (not enabled)

Users

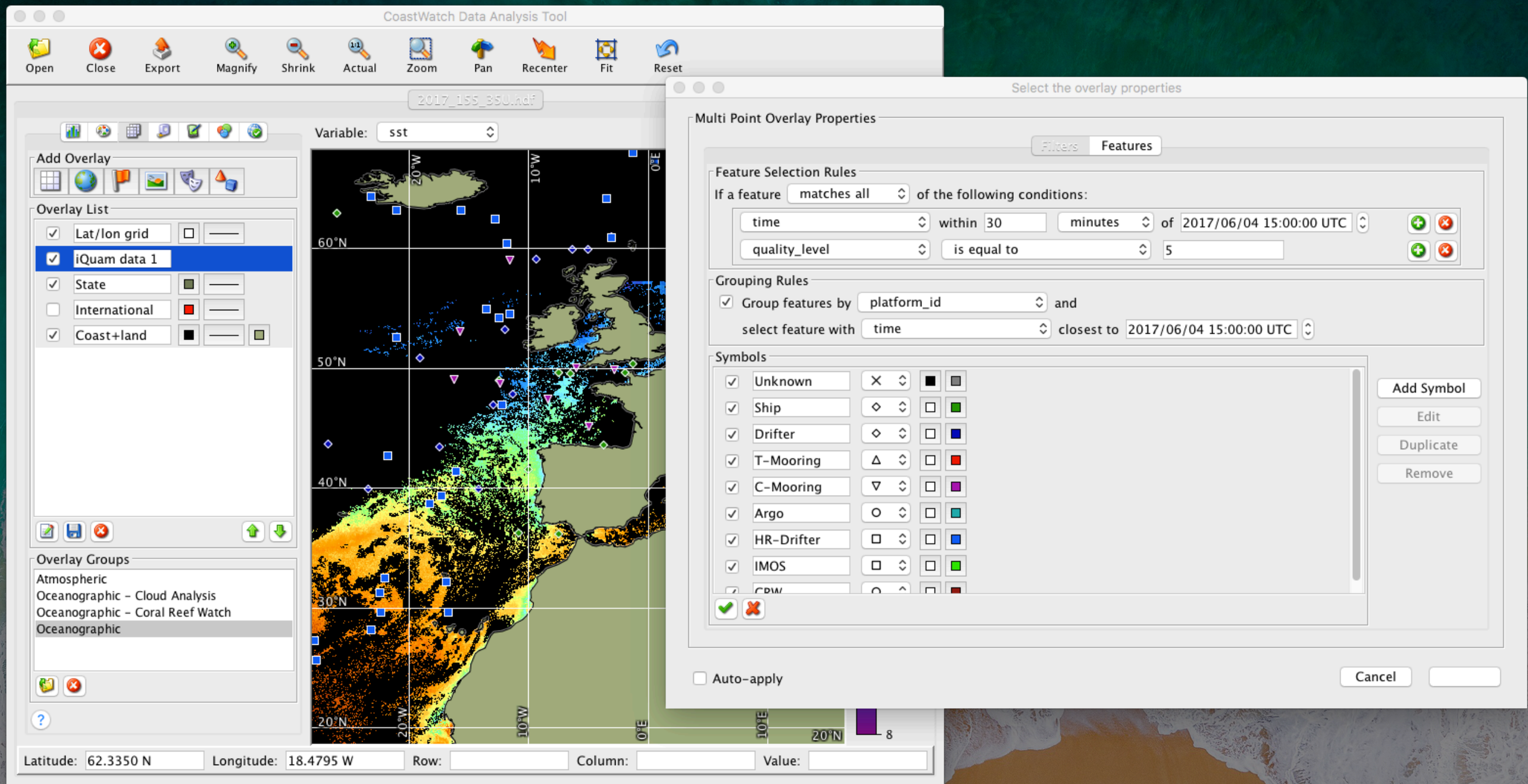
- NESDIS: POES AVHRR image navigation quality
- ACSPO SST group: developing SST and cloud algorithms
- CoastWatch central operations: creating level 3 products, rendering, format conversion, chlorophyll data analysis
- CoastWatch data users: data product viewing, rendering, conversion

Latest & Future Updates

Latest Beta

- Improved NetCDF 3 & 4 reading
- New HDF libraries
- Statistics now run on polygon bounds
- GeoTIFF output handles UTM projections
- Bug fixes on request

Point Features



Suggestions

- Comparison of satellite with in-situ data
- Data processing within CDAT
- New NOAA vector coastline option

Summary

- Historical Perspective
- Development & Functionality
- Download & Usage
- Latest & Future Updates

Acknowledgements

- Funding: Alexander Ignatov, John Sapper, Paul DiGiacomo
- Testing: CoastWatch central operations & nodes